(a) self lubricating materials minimizing wear and galling of the threaded drive shaft and rotor interface.

(b) a gap in the threads to provide a capture space for lubricant when lubrication is needed to protect the threads beyond the natural self lubricating characteristics of the material.

(c) a set of thrust bearings maintaining the rotor in a state of free rotation isolated from the vertical load carried by the bearings.

(d) a wavy spring providing a vertical pre load on the rotor such that there will be a constant direction load carried in the threads of the rotor for all anticipated process fluid pressures.

7. A general compact construction such that the valve drive mechanism maybe disassembled and inspected with out the need to remove or depressurize the process fluid.

8. A construction comprising a contoured discharge port on the valve body within the fluid cavity matching the contour of the diaphragm and integral throttling surface. The matching contours are substantially flat so that if the motor should over run in the close direction the throttling surfaces will bottom out and not deform or otherwise get stuck in the closed position.

ABSTRACT

A throttling valve assembly actuated by a stepper motor having a double diaphragm seal and integral throttling surface. The throttling surface interfaces to a mating orifice and port arrangement to provide a smooth control regime for various process fluids. Because of the unique design of the flow paths the fluids will remain in a laminar flow state throughout the throttling range, thus providing smooth and continuous response to the control input. The valve opening to the fluid controlled by a stepper motor through a direct drive mechanism. The embodiment shown here employees all PTFE construction for the wetting parts, but any material could be used that would be compatible with the process fluid. Additional features are minimal capture of the process fluid, free draining, and no metallic parts in close communication with the process fluid.